

Appl. No.: 10/618,499
Amdt. dated February 11, 2005
Reply to Final Office Action of Dec. 14, 2004

II. Remarks In Response to the Office Action

A. General Remarks

Claims 1-44 are pending in the application. No claims have been added or cancelled with this reply.

For the convenience of the Examiner, Applicants have reprinted portions of the Office Action mailed 12/14/04 in 10-point type, bolded and italicized. Applicants' statements or arguments immediately follow each section.

B. Summary of Interview

The Examiner granted a telephone interview with Sean McDermott (Reg. No. 49,000) and Coe Miles (Reg. No. 38,559) on January 11, 2005. Applicants greatly appreciate the Examiner's granting of the January 11th telephone interview. Applicants have received the Interview Summary (Form PTOL-413) from the Examiner faxed on January 11th and do not disagree with the summary of the interview provided by the Examiner.

C. Claim Rejections – 35 USC § 112

5. *Claims 35-36 and 42-44 are rejected under 35 U.S.C. 112, first paragraph, as failing to comply with the written description requirement. The claim(s) contains subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention.*

The newly added claims 35-36 contain the limitation "a preexisting binder" that was not in the specification as originally presented.

The newly added claim 42 contains the limitation "equal to approximately 80% of the initial water absorption value" that was not in the specification as originally presented.

The newly added claim 43 contains the limitation "equal to approximately 23% of the initial water absorption value" that was not in the specification as originally presented.

The newly added claim 44 contains the limitation "equal to approximately 14% of the initial water absorption value" that was not in the specification as originally presented.

Applicants respectfully traverse the Examiner's conclusion that claims 35-36 and 42-44 fail to comply with the written description requirement. Although the previously filed response of 9/30/2004 cited the specific support for the previously added claims 35-36 and 42-44, Applicants wish to illuminate the support for these claims further by providing a detailed description for the support of each of these claims as found in the originally filed application. In

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light of the detailed support provided below, Applicants respectfully request that the rejection of claims 35-36 and 42-44 under 35 USC § 112, first paragraph, be reconsidered and withdrawn.

1. **Claims 35 & 36:**

Claim 35 recites that “the lignocellulosic substrate comprises a preexisting binder binding lignocellulosic material of the substrate.” Claim 36 recites that “the preexisting binder is selected from the group consisting of a urea-formaldehyde resin, a phenol-formaldehyde resin, and a polyurea resin.”

Support for claims 35 and 36 can be found at Paragraphs [0005], [0033] through [0035]; [0045] through [0046]; Figure 1; and Table 5 of the originally filed specification. In particular, Figure 1 shows a lignocellulosic substrate (1) at a drying stage before being treated with polyisocyanate material. A lignocellulosic substrate is fully described in the present specification as a pre-formed object that has lignocellulosic material bound with a binder and that may be formed into various shapes, such as a strip, panel, block, sheet, veneer or the like. For example, the specification states at Paragraphs [0013] to [0014]:

[0013] The lignocellulosic substrate used to produce the inventive article is made of lignocellulosic material, i.e., material containing both cellulose and lignin. Often, such lignocellulosic material is in a fibrous form. Suitable lignocellulosic materials include wood particles, wood fibers, straw, hemp, sisal, cotton stalk, wheat, bamboo, jute, salt water reeds, palm fronds, flax, groundnut shells, hard woods, or soft woods, as well as fiberboards such as high density fiberboard, medium density fiberboard (MDF), oriented strand board and particle board. Although wheat straw and other bodies of annual plants contain some lignin they are sometimes not referred to as lignocellulosic materials. However, for purposes of the present invention these annual plants are included within the term “lignocellulosic material.” The lignocellulosic substrate is preferably medium density or high density fiberboard.

[0014] The lignocellulosic substrate may be molded or non-molded, and may be in the form of a strip, panel, block, sheet, veneer or the like. The lignocellulosic substrate is preferably suitable for use as a door or door component, including skins, cores, stiles, rails, moldings and the like. It will be obvious to those of ordinary skill in the art, that impregnated lignocellulosic substrate in accordance with the invention may also be

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used in floors, signage, outdoor recreational equipment, furniture, and other building components.

A number of example lignocellulosic substrates are disclosed in the present specification. For example, Paragraphs [0033] through [0035] describe a medium density fiberboard manufactured by Temple and describe a high density fiberboard manufactured by Fibramold of Chile. In addition, Paragraphs [0045] through [0046] and Table 5 describe substrates of Masonite fiberboard and Medex Medit FR fiberboard. In Paragraph [0037] Medite FR is described as "a fire-rated fiberboard advertised by Medex as 'the world's finest exterior grade formaldehyde-free MDF.'" These example substrates have a binder that holds the composite material together, and the present specification states at paragraph [0005] that "[t]he use of urea-formaldehyde or phenol-formaldehyde resins as binder material in wood composites is also known in the art." The example substrates by Temple, Fibramold, Masonite fiberboard, and Medex Medit FR fiberboard have binders selected from urea-formaldehyde resin, a phenol-formaldehyde resin, and a polyurea resin.

Therefore, the specification discloses that a lignocellulosic substrate has a preexisting binder used to form the lignocellulosic material into the substrate. Thus, claims 35 and 36 are directed to subject matter which was described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. Reconsideration and withdrawal of the rejection of claims 34-35 under 35 USC § 112, first paragraph, is respectfully requested.

2. Claim 42

Claim 42 recites that "the lignocellulosic substrate without impregnation of the polyisocyanate material has an initial water absorption value, and wherein the lignocellulosic substrate impregnated with the polyisocyanate material has a water absorption value that is less than or equal to approximately 80% of the initial water absorption value."

Support for claim 42 can be found at Paragraph [0044] and Table 5. In particular, Paragraph [0044] states that "[t]he percent water absorption [for comparative examples *CE-2* and *CE-3* and *Test Sample 7* of Table 5] was calculated by dividing the change in weight due to the

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24 hour soak by the initial weight." Table 5 shows that *Test Sample 7* had a "%-Water Absorption" value of 12, while comparative example *CE-2* had a "%-Water Absorption" value of 15. Therefore, the specification shows that the water absorption value of *Test Sample 7* is about 80% (*i.e.*, 12/15) of the water absorption value of comparative example *CE-2*.

Because the specification contains written description of the limitations of claim 42, the subject matter contained in claim 42 was described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. Reconsideration and withdrawal of the rejection of claim 42 under 35 USC § 112, first paragraph, is respectfully requested.

3. Claim 43

Claim 43 recites that "the lignocellulosic substrate without impregnation of the polyisocyanate material has an initial water absorption value, and wherein the lignocellulosic substrate impregnated with the polyisocyanate material has a water gain value that is less than or equal to approximately 23% of the initial water absorption value."

Support for claim 43 can be found at Paragraph [0044] and Table 5. In particular, Paragraph [0044] states that "[t]he percent water absorption [for comparative examples *CE-2* and *CE-3* and *Test Sample 7* of Table 5] was calculated by dividing the change in weight due to the 24 hour soak by the initial weight." Table 5 shows that *Test Sample 7* had a "%-Water Absorption" value of 12, while comparative example *CE-3* had a "%-Water Absorption" value of 52. Therefore, the specification shows that the water absorption value of *Test Sample 7* is about 23% (*i.e.*, 12/52) of the water absorption value of comparative example *CE-3*.

Because the specification contains written description of the limitations of claim 43, the subject matter contained in claim 43 was described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. Reconsideration and withdrawal of the rejection of claim 43 under 35 USC § 112, first paragraph, is respectfully requested.

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4. Claim 44

Claim 44 recites that “the lignocellulosic substrate without impregnation of the polyisocyanate material has an initial water absorption value, and wherein the lignocellulosic substrate impregnated with the polyisocyanate material has a water absorption value that is less than or equal to approximately 14% of the initial water absorption value.”

Support for claim 44 can be found at Paragraph [0041] and Table 2. In particular, Paragraph [0041] states that “[t]he percent water gain for each test sample and comparative sample *CE-1* [of Table 5] was calculated by dividing the weight of water gained by the samples due to the boil by the weight of the sample before the boil, and multiplying by 100%. The results are tabulated in Table 2.” Table 2 shows that *Test Example No. 3A* had a “%-Water Gain” value of 4.45%, while comparative example *CE-1* had a “%-Water Gain” value of 32.7%. Therefore, the specification shows that the water absorption value of *Test Example No. 3A* is about 14% (i.e., 4.45/32.7) of the water absorption value of comparative example *CE-1*. Furthermore, the water absorption values of the other *Test Example Nos. 1A-1D, 2A-2C, 3B-3C, 4A-4C, 5A-5C, and 6A-6B* are less than 14%. For example, the water absorption value of the *Test Example No. 1B* is about 4.8% (i.e., 1.58/32.7) of the water absorption value of comparative example *CE-1*, and the water absorption value of the *Test Example No. 2B* is about 5.0% (i.e., 1.7/32.7) of the water absorption value of comparative example *CE-1*.

Therefore, the specification at Paragraphs [0041] and Table 2 provides comparative examples showing that a lignocellulosic substrate impregnated with the polyisocyanate material according to the present invention has a water absorption value that is less than or equal to approximately 14% of the initial water absorption value of the unimpregnated substrates. Because the specification contains written description of the limitations of claim 44, the subject matter contained in claim 44 was described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor, at the time the application was filed, had possession of the claimed invention. Reconsideration and withdrawal of the rejection of claim 44 under 35 USC § 112, first paragraph, is respectfully requested.

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D. Claim Rejections - 35 USC § 102

7. *Claims 1-5, 15-23, 33-40, 42-44 are rejected under 35 U.S.C. 102 (b) as being anticipated by Diehr et al. (US Pat. 3,870,665).*

In regards to claims 1-5, 15-23, 33-34, 37-39, Diehr teaches a sheet or board for building purposes, comprising a lignocellulosic material, impregnated with an organic polyisocyanate (see abstract; 601, 1, In. 6-27). The lignocellulosic material used can be chipboard, fiberboard, wood, or straw (see col. 1, In. 32-34; col. 4, In. 46-51). The isocyanate is diphenylmethane diisocyanate (methylene diphenyl diisocyanate) (see Example 1). Diehr further teaches the surface of the board to be smooth (see Example 8).

Although Diehr is silent with respect to a low-gloss surface or that the impregnated lignocellulosic material is substantially non-conductive, since the reference teaches the same product containing the same chemical constituents, the board of the reference would inherently have the same properties, such as low-gloss surface and substantially non-conductive, as the presently claimed invention.

With respect to process limitations, such as how the lignocellulosic material is being formed or how impregnation is carried out, it has been within the skill in the art that process limitations would have no significant patentable weight when a product claim is being considered. See MPEP 2113.

In regards to claims 35-36, Diehr teaches the lignocellulosic material containing a ureaformaldehyde or phenol-formaldehyde binder (see claim 10).

In regards to claim 40, Diehr teaches the lignocellulosic material containing 7% moisture content before impregnation of polyisocyanate (see Examples 9-10).

In regards to claims 42-44, Diehr teaches the lignocellulosic material being moisture resistant (see Example 1, 5), which appears to read on the instantly claimed ranges.

1. Claims 1-5 Are Not Anticipated by Diehr

Applicants respectfully traverse the Examiner's conclusion that Diehr (US 3,870,665) anticipates claims 1-5 in so far as Diehr does not imply the structure imparted by the process steps of claim 1. There are two exceptions recognized in MPEP 2113 where patentable weight is given to process steps when considering a product-by-process claim. "*The structure implied by the process steps should be considered when assessing the patentability of product-by-process claims over the prior art, especially where the product can only be defined by the process steps by which the product is made, or where the manufacturing process steps would be expected to impart distinctive structural characteristics to the final product.*" (emphasis added) MPEP 2113 citing *In re Garnero*, 412 F.2d 276, 279, 162 USPQ 221, 223 (CCPA 1979). Applicants contend that the process steps of claim 1 impart distinctive structural characteristics to the building article of claim 1 and its surface. Therefore, the structure implied by the process steps of claim 1 should be considered when assessing the patentability of claim 1. Furthermore, as Applicants argue below, Diehr does not anticipate claim 1 because Diehr fails to imply the distinctive structural characteristics imparted by the process steps of claim 1.

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Claim 1 recites:

1. A building article having a smooth, low-gloss surface prepared by:
 - (1) impregnating a lignocellulosic material with an isocyanate resin material;
 - (2) removing excess isocyanate resin from the impregnated lignocellulosic material by impinging air at a high flow rate upon the impregnated lignocellulosic material;
 - (3) polymerizing the resin by applying water to the impregnated lignocellulosic material, the water being at a temperature sufficient for polymerization; and
 - (4) removing the water from the polymerized resin-impregnated lignocellulosic material.

First, the building article in claim 1 having the smooth, low-gloss surface is prepared by *impregnating* a lignocellulosic material with an isocyanate resin material so that the lignocellulosic material is "*impregnated*" with isocyanate resin material. Furthermore, the article of claim 1 is prepared by *removing excess resin* from the *impregnated material*, which is achieved by *impinging air* at a high flow rate upon the impregnated material. The process steps of impregnating material, removing excess resin from impregnated material, and impinging air upon impregnated material affect the article, its surface, and its chemical make-up and would be expected to impart distinctive structural characteristics to the article of claim 1 and its surface. Therefore, the structure implied by these process steps of claim 1 should be considered when assessing the patentability of claim 1.

Diehr, in contrast to claim 1, does not disclose impregnating lignocellulosic material with an isocyanate resin material nor removing excess resin from the impregnated material by impinging air. Instead, Diehr discloses a compression molded article prepared by "a process for molding a lignocellulose material such as wood chips, shavings or the like with an organic polyisocyanate binder in a mold coated with a release agent which contains a catalyst for the polymerization of -NCO groups to form isocyanurate rings" Diehr at col. 2, ll. 5-9. Because Diehr applies steel sheets of a mold to a loose material mixed with isocyanate resin to form an article, Diehr does not imply the distinctive structural characteristics imparted by the process steps of claim 1 related to impregnating material, removing excess resin from impregnated

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material, and impinging air upon impregnated material. Consequently, claim 1 is not anticipated by Diehr.

Second, the building article in claim 1 having the smooth, low-gloss surface is also prepared by *polymerizing the resin* of the impregnated material by *applying water* to the impregnated material. The process steps of polymerizing resin of impregnated material by applying water to it affects the article, its surface, and its chemical make-up and would be expected to impart distinctive structural characteristics to the article and its surface. Therefore, the structure implied by these process steps of claim 1 should also be considered when assessing the patentability of claim 1.

Diehr, in contrast to claim 1, does not disclose polymerizing resin of impregnated material by applying water. Instead, Diehr discloses using a release agent with a catalyst coated on a mold so that sides of the article in Diehr can be spontaneously detached from steel sheets used to form a mixture of material and resin into an article. *See* Diehr at col. 7, ll. 7-9. For example, Diehr discloses that a catalyst coated on the mold is used for the polymerization of -NCO groups to form isocyanurate rings on the sides of the article. *See* Diehr at col. 2, ll. 5-9. Various chemical compositions for catalysts that can be used for mold release agents are also disclosed. *See* Diehr at col. 2, line 35 to col. 3, line 28. Because Diehr coats a mold with a release agent containing a catalyst for polymerization, Diehr does not imply the distinctive structural characteristics imparted by the process steps of claim 1 related to by polymerizing resin of impregnated material by applying water to it. Consequently, claim 1 is not anticipated by Diehr.

As Applicants have argued above, the process steps of claim 1 should be considered when assessing the patentability of claim 1 over Diehr. *See* MPEP 2113. When properly considered, the claimed process steps would be expected to impart distinctive structural characteristics to a building article and its surface in ways not at all implied by Diehr. For at least these reasons, Applicants believe that claim 1 and claims 2-14 depending therefrom are in proper form for allowance and respectfully request that the Examiner indicate the allowance of these claims in the next paper from the Office.

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2. Claims 15-23, 33-40, & 42-44 Are Not Anticipated by Diehr

Applicants respectfully traverse the Examiner's conclusion that Diehr (US 3,870,665) anticipates the listed claims 15-23, 33-40, and 42-44 in so far as Diehr does not teach or suggest all the limitations in independent claim 16 as amended.

Amended independent claim 16 recites:

16. An article comprising a preformed lignocellulosic substrate impregnated with a polyisocyanate material, wherein the impregnated lignocellulosic substrate comprises a smooth, low-gloss surface.

Claim 16 requires a "lignocellulosic substrate." Applicants contend that the meaning of "substrate," by itself, implies a foundation or thing already formed. However, to clarify the claim, Applicants have amended claim 16 to recite "a preformed lignocellulosic substrate impregnated with a polyisocyanate material." Being preformed and impregnated, the substrate of claim 16 is different than the molded article of Diehr. The molded article in Diehr is not a preformed substrate of lignocellulosic material that is impregnated with a polyisocyanate material. Rather, Diehr discloses forming an article by mixing loose lignocellulose material with isocyanate¹, applying a release agent with the catalyst on a mold, and compression molding the material mixed with the isocyanate, where the release agent enables the sides of the article to be spontaneously detached from the steel sheets used to form the article. *See e.g.*, Diehr at col. 2, ll. 5-9; col. 4, ll. 42-65; and col. 7, ll. 7-9. Thus, the molded article in Diehr is not preformed when impregnated.

Because Diehr does not teach or suggest a preformed lignocellulosic substrate impregnated with a polyisocyanate material, as required in claim 16, Diehr does not anticipate claim 16. For at least these reasons, Applicants believe that claim 16 and claims 15 and 17-44

¹ The Final Office Action contends that Diehr discloses polyisocyanate used as a binder and/or impregnating agent for lignocellulose material. However, the use of the term "impregnating agent" in Diehr must be considered in the context of Diehr's disclosure. Notably, Diehr discloses that "if the lignocellulose material is first mixed in the usual manner with about 1 percent to 100 percent by weight (based on dry substance) of the isocyanate based binder or impregnating agent." (emphasis added) Diehr at col. 4, ll. 54-55. In the context of Diehr, then, polyisocyanate is only disclosed as being mixed with loose lignocellulose material when forming a compression molded article and is not disclosed as being used to impregnate a preformed substrate.

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depending therefrom are in proper form for allowance and respectfully request that the Examiner indicate the allowance of these claims in the next paper from the Office.

E. Claim Rejections - 35 USC § 103

9. *Claims 6-14 and 24-32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Diehr as applied to claims 1 and 14 above.*

Diehr is as set forth in claims 1 and 14 above and incorporated herein.

Diehr teaches the lignocellulosic material to be used in building purposes such as veneer, sheets, and the like (see col. 1, ln. 6-21). Hence, although the reference does not specifically teach the material to be used as construction components as recited in the instant claims, it would have been obvious to one of ordinary skill in the art, at the time the invention was made, that these structures would have been variations in the use of the lignocellulosic material.

Applicants respectfully traverse the Examiner's conclusion that Diehr renders the listed claims 6-14 and 24-32 obvious in so far as Diehr does not teach or suggest all the limitations in independent claims 1 and 16, from which claim 6-14 and 24-32 depend. For at least the same reasons presented above, Applicants believe that claims 6-13 and 24-33 are not rendered obvious over Diehr and respectfully requests that the Examiner indicate the allowance of these claims in the next paper from the Office.

E. Allowable Subject Matter

10. *Claim 41 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.*

11. *The following is a statement of reasons for the indication of allowable subject matter: no prior art has been found to teach, disclose, or fairly suggest a lignocellulosic substrate comprising a moisture content of about 0.1 to 2.5% by weight after the substrate is dried and before the substrate is impregnated with the polyisocyanate material; in combination with all of the limitations of claims 16 and 40.*

Claim 41 has been rewritten in independent form to include all of the limitations of the base claim 16 and intervening claim 40. Therefore, claim 41 is believed to be allowable, and Applicants respectfully request its allowance in the next paper from the Office.

F. Fees

No fee is believed due. The undersigned representative requests any extension of time that may be deemed necessary to further the prosecution of this application. Should any fees be

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due for any reason, the undersigned representative authorizes the Commissioner to charge any additional fees that may be required, or credit any overpayment, to Deposit Account No. 501922/124-0002US-D.

To facilitate the resolution of any issues or questions presented by this paper, Applicants respectfully request that the Examiner directly contact the undersigned representative by phone to further the discussion, reconsideration, and allowance of the claims.

Respectfully submitted,

Date: Feb. 1, 2003

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